TRANSMITTAL OF APPEAL BRIEF	Docket No. 0941-0913P

In re Application of: Cheng-Chieh LIU et al.

Application No.	Filing Date	Examiner	Group Art Unit
10/776,510-Conf. #3680	February 12, 2004	R. I. Duda	2837

Invention: MOTOR SPEED CONTROL DEVICE

TO THE COMMISSIONER OF PATENTS:

Transmitted herewith is the Appeal Brief in this application, with respect to the Notice of Appeal filed: November 13, 2006 .

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Dated: January 12, 2007

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Docket No.: 0941-0913P
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Cheng-Chieh LIU et al.

Application No.: 10/776,510 Confirmation No.: 3680

Filed: February 12, 2004 Art Unit: 2837

For: MOTOR SPEED CONTROL DEVICE Examiner: R. I. Duda

APPEAL BRIEF

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

As required under § 41.37(a), this brief is filed within two months of the Notice of Appeal filed in this case on November 13, 2006, and is in furtherance of said Notice of Appeal.

The fees required under § 41.20(b)(2) are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This brief contains items under the following headings as required by 37 C.F.R. § 41.37 and M.P.E.P. § 1206:

KM/RFG/cdr

I. REAL PARTY IN INTEREST

The real party in interest for this appeal is:

Delta Electronics Inc. as noted in the assignment filed February 12, 2004 at reel 014983/frame 0064.

II. RELATED APPEALS, INTERFERENCES, AND JUDICIAL PROCEEDINGS

There are no other appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

A. Total Number of Claims in Application

There are 17 claims pending in application.

B. Current Status of Claims

1. Claims canceled: None
2. Claims withdrawn from consideration but not canceled: None
3. Claims pending: 1-17
4. Claims allowed: None
5. Claims rejected: 1-17

C. Claims On Appeal

The claims on appeal are claims 1-17

IV. STATUS OF AMENDMENTS

Applicants filed a Response on October 11, 2006 including only remarks. This was entered and considered by the Examiner but did not place the application in condition for allowance as noted by the Advisory Action of October 30, 2006.

V. SUMMARY OF CLAIMED SUBJECT MATTER

In General

The present invention relates to a motor speed control device for a fan, especially where the fan is used to cool electronic equipment. A thermal sensor, such as a thermistor RTH detects the temperature of the environment and provides a voltage to a control element which then controls a driving element to control the speed of the fan. The arrangement of a thermistor resistor, a general control element, and a driving element is known as shown in Figure 1. However, a further adjustment of the voltage from the thermal sensor is desirable in order to adjust the range of temperatures and speeds and the rate of response of the fan.

Independent Claim 1

Claim 1 is generic to the embodiment shown in Figures 3a, 4a, 5a and 6. The driving integration circuit IC1 (page 5, line 18) receives an input from Hall induction integration circuit IC2 (page 5, lines 14-15) which detects the relative positions of the coils and rings. IC1 and IC2 constitute a driving element to drive the fan (page 5, line 20). A thermal sensor RTH (page 5, line 23) detects the temperature of the environment and has different resistances at different temperatures so that the voltage V1 varies with the temperature (page 5, lines 26-29). However, rather than providing this signal alone to IC1, additional circuitry is used to adjust the temperature signal. In the embodiment of Figure 3a, this a switch circuit. In the embodiment of Figure 4a, this is a series connection with a resistor. In the embodiment of Figure 5a, this is a subtraction circuit. In the embodiment Figure 6, this is a division circuit 61, a comparison circuit 62 and output circuit 63. In the first embodiment, the switch circuit 31 includes a comparator, a transistor TR1 and two resistors Ro and R5 (page 5, lines 24-26). In the second embodiment, the series connected resistor is R4 as described on page 6, line 30 to page 7, line 3. In the third

embodiment, the subtraction circuit 51 includes a comparator and six resistors R6-R11 as described at page 7, lines 22-25. In the fourth embodiment, the division circuit 61, the comparison circuit 62 and output 63 are described on page 8, line 9-12.

Dependent claims 2-13

Claim 2 describes the thermal sensor as thermistor (page 5, line 23).

Claim 3 indicates that the driving element includes a Hall sensor and driver IC. This is described on page 5, lines 14-21.

Claim 4-6 relate specifically to embodiment in Figure 3a. The control element is described as a switch circuit in claim 4. This refers to switch circuit 31 as indicated at page 5, line 24. Claim 5 further describes a switch circuit as including a comparator, a transistor and two resistors. This is described on page 5, lines 24 and 25 and refers to transistor TR1 and resistors R0 and R5. Claim 6 describes the parallel connection of one resistor and the voltage response due to this connection. This is described on page 6, lines 14 and 24.

Claim 7 describes the embodiment shown in Figure 4a including a series connection of a resistor with a thermal sensor and the resultant control of the fan. The refers to resistor R4 and is described on page 6, line 30 – page 7, line 3 and page 7, lines 11-14.

Claims 8-10 refer to the embodiment of Figure 5a. Claim 8 describes the control element as being a subtraction circuit. This is described on page 7, line 21 where the subtraction circuit is identified by reference numeral 51. Claim 9 describes the subtraction circuit as including a comparator and at least four resistors. This described on page 7, lines 22-25. Claim 10 further describes the generation of a second voltage to adjust a third voltage output. This is described on page 7, line 26 – page 8, line 3.

Claims 11-13 refer to the embodiment of Figure 6. Claim 11 refers to division circuit 61, comparator 62 and output circuit 63 as described on page, lines 9-12. Claim 12 describes the output of the output circuit which is described on page 8, lines 13-16. Claim 13 further describes the operation of the division circuit which is described on page 8, line 16-22.

Independent claim 14

Claim 14 specifically describes the first embodiment. The claim includes all of the limitations of claim 1, except for the final 2 lines. Claim 14 further adds the description of the switch circuit 31, the resistor R5 connected in parallel to thermal sensor and the resultant change in voltage. This is best described on page 6, lines 14-24.

Independent claim 15

Claim 15 specifically refers to the second embodiment and includes all of the limitations of claim 1 except for the final 2 lines. Claim 15 further describes the control element as being a resistor connected in series with a thermal sensor as is described page 6, line 30 – page 7, line 3. The resultant voltage change is described on page 7, lines 11-14.

Independent claim 16

Claim 16 specifically refers to the third embodiment and includes all of the limitations of claim 1 except for the final 2 lines. Claim 16 adds that the control element is a subtraction circuit with three resistors and describes the change in voltage as a result. This is described on page 7, lines 20-24 and page 7, line 29 – page 8, line 3.

Independent claim 17

Claim 17 specifically refers to the fourth embodiment and includes all of the limitations of claim 1 except for the final 2 lines. Claim 17 adds the output of the control element when the first voltage exceeds the reference voltage and when the first voltage is smaller the reference voltage. This is described on page 8, lines 13-22.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The only rejection applied against the claims is a rejection the claims 1-17 under 35 USC 102(b) as being anticipated by Cheng, US Patent 5,197,858.

The Examiner states that Cheng describes a variable speed fan having a thermal sensor RTH which detects an environmental temperature of the fan, and a driving element IC2 driving the fan L1-L4 to a specific speed based on the detected temperature. Control elements IC31/TR1/TR2 are connected between the temperature sensor and the driving element for changing the rotation of the fan by adjusting the first voltage across Rth. The circuit diagram of Figure 2 also shows a Hall element IC1, a driving integrated circuit IC2, switches TR1 and TR1, operation amplifiers IC31, IC32 and IC33 and various resistors. Column 2, lines 56-66 describe the use of the operational amplifier IC31 and the thermal sensor to control the slope of the curve of the speed versus temperature.

VII. ARGUMENT

Rejection of claims 1-17 under 35 USC 102(b)
as being anticipated Cheng (US Patent 5,197,858)

Independent Claim 1

Applicants submit that the Cheng reference does not show the control element as described in claim 1. In Cheng, the voltage from the thermal sensor is applied to a comparator IC31 and is thereby compared to a reference voltage. The output of the comparator indicates the result of this comparison and is used to control transistor TR2 and thus the speed of the motor. Applicants submit that this is the manner in which the prior art directly controls the speed of the fan in relationship to the output of the thermal sensor. Thus, the output of the thermal sensor is compared to a reference voltage and depending on the size of the difference, the speed of the fan is controlled to go faster or slower. This corresponds generally to the prior art shown in Figure 1 of the present application.

Claim 1 differs from this arrangement by specifically including a control element which adjusts the first voltage of the thermal sensor to change the rotation speed and temperature range of the fan. The Cheng reference does not show such an adjusting and does not show the change in rotation speed and temperature range of the fan. Instead, the Cheng only shows the direct driving of the fan in relationship to the output of the thermal sensor.

The present invention allows the fan to be controlled over a different range of speeds and temperature than would be done with the standard arrangement such as shown in Cheng. Thus, the thermal sensor is connected to additional circuitry elements so that the output of the sensor is adjusted before it is sent to the driving element to drive the fan. Each of the four embodiments shows a different circuit element for performing this adjustment. Applicants submit that Cheng does not show a control element which adjusts the first voltage of the thermal sensor and thereby changes the rotation speed and temperature range of the fan. The change in the ranges of the fan speed and temperature are further described and shown in Figures 4b and 5b. Each of these Figures and the corresponding description in the specification show the original curve which could be expected from the thermal sensor and how the adjustment changes the range.

In order to show how this adjustment is accomplished, reference to made to Figure 3a where the voltage V1 is produced by thermal sensor and compared with reference voltage V2. The output voltage V3 is used to turn on transistor TR1. This causes current to flow through the transistor to ground. However, the current flows from the power source through resistor R3 through thermal sensor RTH to ground. As a result, the voltage V1 is adjusted when the transistor is turned on because resistor R5 is parallel with the thermal sensor and current flows through resistor R5 when the transistor is turned on. Thus, the control element 31 changes the voltage output from the thermal sensor to adjust the temperature range of the fan as shown in Figure 3b.

Dependent claims 2-13

Claim 2-13 all depend from claim 1 and are allowable based on this dependency.

In addition, claims 4-6 relate to the first embodiment and specifically describe the control element as a switch circuit in claim 4. Claim 5 further describes the elements of the switch circuit and claim 6 further describes the changes of the first voltage. Applicants submit that Cheng does not show such a switch circuit and, in particular, does not show the comparator, transistor and two resistors nor the specific change in voltage as described by these claims.

Claim 7 specifically describes the serial connection of the resistor as shown in the second embodiment. Applicants submit that Cheng does not show such a series connection of the resistor and the control of the temperature range of the fan.

Claims 8-10 relate to the third embodiment and describe the control element as a subtraction circuit. Cheng does not show such a subtraction circuit in any fashion. Claim 9 specifically describes the comparator and four resistors which is also not seen in Cheng.

Claims 11-13 relate to the embodiment of Figure 6. Claim 11 specifically describes the division circuit, comparator and output circuit. This arrangement is not shown in Cheng in any fashion. Claims 12 and 13 relate to the specific voltage levels produced. This is also not described by Cheng.

Independent Claim 14

Independent claim 14 includes the elements of claim 1 and specifically includes the control for adjusting the first voltage of the thermal sensor. Thus, claim 14 is allowable for the reasons described above in regard to claim 1. Further, claim 14 describes the specific circuitry of the first embodiment including the switch circuit, parallel connection of the sensor with a resistor and the change in the first voltage. This specific arrangement is not shown in Cheng.

Independent Claim 15

Independent claim 15 includes the elements of claim 1 and is allowable for the reasons cited there, especially for including the control element which adjusts the first voltage of the thermal sensor. Claim 15 further includes the serial connection with a resistor which is also not described in Cheng.

Independent Claim 16

Independent claim 16 includes the elements of claim 1 and especially the control element which adjust the first voltage of the thermal sensor. Claim 16 is allowable for the reasons recited above in regard to claim 1. Further, this claim specifically describes the control element as a subtraction circuit and includes three resistors. The Cheng reference does not show the

subtraction circuit including three resistors or the adjustment of the first voltage. Accordingly, claim 16 is also allowable.

Independent Claim 17

Claim 17 includes the limitations of claim 1 and is allowable for the reasons recited there, especially the control element for adjusting the first voltage of the thermal sensor. In addition, claim 17 further describes output when the first voltage exceeds the reference voltage or when the first voltage is smaller than the reference voltage. This specific operation is not shown by Cheng in any manner. Accordingly, Applicants submit that claim 17 is further allowable.

VIII. CLAIMS

The claims are the original claims and are submitted in Appendix A.

IX. EVIDENCE

No evidence pursuant to §§ 1.130, 1.131, or 1.132 or entered by or relied upon by the examiner is being submitted.

X. CONCLUSION

In view of the above, Applicants submit that rejection of the claims is in error and request that the Examiner be reversed.

Dated: January 12, 2007

Respectfully submitted,

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APPENDIX A

Claims Involved in the Appeal of Application Serial No. 10/776,510

1. A motor speed control device, applied to a fan, comprising:

a thermal sensor detecting an environmental temperature of the fan;

a driving element driving the fan to a specific speed according to the detected temperature; and

a control element connected electrically between the driving element and the thermal sensor for adjusting a first voltage of the thermal sensor to change a rotation speed and a temperature range of the fan.

2. The motor speed control device as claimed in claim 1, wherein the thermal sensor is a thermistor.

3. The motor speed control device as claimed in claim 1, wherein the driving element comprises a Hall sensor and a driver IC.

4 The motor speed control device as claimed in claim 1, wherein the control element is a switch circuit.

5. The motor speed control device as claimed in claim 4, wherein the switch circuit comprises a comparator, a transistor, and two resistors.

6. The motor speed control device as claimed in claim 5, wherein one resistor of the switch circuit is electrically connected in parallel with the thermal sensor such that the first voltage rapidly decreases below a reference voltage of the driving element to turn on the transistor and reduce the temperature range of the fan to a full speed.

7. The motor speed control device as claimed in claim 1, wherein the control element is a

resistor electrically connected in serial with the thermal sensor and controlling the temperature range of the fan to a full speed by adjusting a resistance of the resistor and reducing a variation of the first voltage.

8. The motor speed control device as claimed in claim 1, wherein the control element is a subtraction circuit.

9. The motor speed control device as claimed in claim 8, wherein the subtraction circuit comprises a comparator and at least four resistors.

10. The motor speed control device as claimed in claim 9, wherein three resistors of the subtraction circuit generate a second voltage to adjust a third voltage output to the driving element so as to reduce the temperature range of the fan to a full speed.

11. The motor speed control device as claimed in claim 1, wherein the control element comprises a division circuit, a comparator, and an output circuit.

12. The motor speed control device as claimed in claim 11, wherein when the first voltage exceeds a reference voltage of the driving element, the output circuit outputs a voltage equal to the reference voltage to the driving element so as to keep the fan at a relatively low speed.

13. The motor speed control device as claimed in claim 12, wherein when the first voltage is less than the reference voltage of the driving element, a voltage input to the driving element is divided by N through the division circuit to rapidly drive the fan to a full speed, wherein N is a natural number.

14. A motor speed control device, applied to a fan, comprising:

a thermal sensor detecting an environmental temperature of the fan;

a driving element driving the fan to a specific speed according to the detected

temperature; and

a control element connected electrically between the driving element and the thermal sensor for adjusting a first voltage of the thermal sensor, wherein the control element is a switch circuit, and a resistor of the switch circuit is electrically connected in parallel with the thermal sensor such that the first voltage rapidly decreases below a reference voltage of the driving element, reducing a temperature range of the fan to a full speed.

15. A motor speed control device, applied to a fan, comprising:

a thermal sensor detecting an environmental temperature of the fan;

a driving element driving the fan to a specific speed according to the detected temperature; and

a control element connected electrically between the driving element and the thermal sensor for adjusting a first voltage of the thermal sensor, wherein the control element is a resistor electrically connected in serial with the thermal sensor for controlling a temperature range of the fan to a full speed by adjusting a resistance of the resistor and reducing a variation of the first voltage.

16. A motor speed control device, applied to a fan, comprising:

a thermal sensor detecting an environmental temperature of the fan;

a driving element driving the fan to a specific speed according to the detected temperature; and

a control element connected electrically between the driving element and the thermal sensor for adjusting a first voltage of the thermal sensor, wherein the control element is a subtraction circuit, and three resistors of the subtraction circuit generate a second voltage to adjust the first voltage to reduce a temperature range of the fan to a full speed.

17. A motor speed control device, applied to a fan, comprising:

a thermal sensor detecting an environmental temperature of the fan;

a driving element driving the fan to a specific speed according to the detected

temperature; and

a control element connected electrically between the driving element and the thermal sensor for adjusting a first voltage of the thermal sensor, wherein when the first voltage exceeds a reference voltage of the driving element, the control element outputs a voltage equal to the reference voltage to be input to the driving element so as to keep the fan at a relatively low speed, and when the first voltage is smaller than the reference voltage of the driving element, the voltage input to the driving element is divided by N through the control element to quickly increase the fan to a full speed, wherein N is a natural number.

APPENDIX B

No evidence pursuant to §§ 1.130, 1.131, or 1.132 or entered by or relied upon by the examiner is being submitted.

APPENDIX C

No related proceedings are referenced in II. above, hence copies of decisions in related proceedings are not provided.